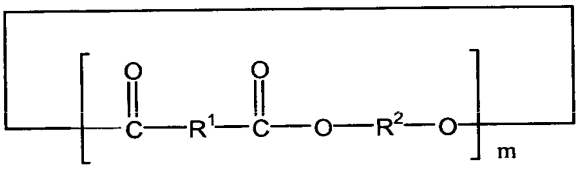
CLAIMS

What is claimed is:

1. A process for the copolymerization of cyclic ester oligomers, comprising, contacting under ring opening polymerization conditions a mixture of two or more molten chemically different cyclic ester oligomers of the formula



(I)

with a catalyst for the ring opening polymerization of cyclic ester oligomers, to form a copolyester, wherein:

R^1 and R^2 are each independently hydrocarbylene or substituted hydrocarbylene; and

m is an integer of 1 or more; and

provided that when every R^1 in each molecule of cyclic ester oligomer is not the same and/or every R^2 in each molecule of cyclic ester oligomer is not the same, at least two of the chemically different cyclic ester oligomers present are at least 15 mole percent to total amount of cyclic ester oligomers present.

2. The process as recited in claim 1 wherein in each cyclic ester oligomer R^1 and R^2 are the same.

3. The process as recited in claims 1 or 2 wherein at least one of said chemically different cyclic ester oligomers are derived from:

(a) a diol component selected from the group consisting of diols of the formula $HOCH_2(CR^3R^4)_qCH_2OH$ or $HO(CH_2CH_2O)_tH$ wherein R^3 and R^4 are each independently hydrogen or alkyl, and q is 0 or an integer of 1 to 10, or t is an integer of 2 to 20, hydroquinone, and bisphenol-A, and combination thereof; and

(b) a dicarboxylic acid component selected from the group consisting of compounds of the formula $HO_2C(CH_2)_nCO_2H$ wherein n is an integer of 1 to 10, isophthalic acid, substituted isophthalic acids, terephthalic acid, substituted terephthalic acids, and 2,6-naphthalenedicarboxylic acid, and combinations thereof.

4. The process as recited in claim 1 or 2 wherein at least one of said chemically different cyclic ester oligomers are derived from a combination of:

terephthalic acid with diethylene glycol, ethylene glycol, 1,3-propanediol, 1,4-butanediol, 1,5-pentanediol, and 1,6-hexanediol or a mixture thereof;

isophthalic acid with diethylene glycol, ethylene glycol, 1,3-propanediol, 1,4-butanediol, 1,5pentanediol, and 1,6-hexanediol or a mixture thereof; or

one or both of succinic and adipic acids with one or more compounds of the formula $HOCH_2(CR^3R^4)_nCH_2OH$, wherein R^3 and R^4 are hydrogen or alkyl containing 1 to 4 carbon atoms and n is 0 or an integer of 1 to 10.

5.The process as recited in claim 1 wherein every R^1 and every R^2 in each molecule of cyclic ester oligomer are not the same, at least two of the chemically different cyclic ester oligomers present are at least 20 mole percent of said total amount of said cyclic ester oligomers present.

6. The process as recited in claim 1 wherein a polymerization catalyst is present.

7. A process for encapsulating or coating an object, comprising, contacting said object with a molten mixture of two or more chemically different cyclic ester oligomers and copolymerizing said molten mixture to form a copolyester which encapsulates or coats said object.

8. The process as recited in claim 7 wherein repeat units within each molecule of cyclic ester oligomer are identical.

9. The process as recited in claim 8 or 9 at least one of said chemically different cyclic ester oligomers are derived from:

(a) a diol component selected from the group consisting of diols of the formula $HOCH_2(CR^3R^4)_qCH_2OH$ or $HO(CH_2CH_2O)_tH$ wherein R^3 and R^4 are each independently hydrogen or alkyl, and q is 0 or an integer of 1 to 10, or t is an integer of 2 to 20, hydroquinone, and bisphenol-A, and combination thereof; and

(b) a dicarboxylic acid component selected from the group consisting of compounds of the formula $HO_2C(CH_2)_nCO_2H$ wherein n is an integer of 1 to 10, isophthalic acid, substituted isophthalic acids, terephthalic acid, substituted terephthalic acids, and 2,6-naphthalenedicarboxylic acid, and combinations thereof.

10. The process as recited in claim 8 or 9 wherein at least one of said chemically different cyclic ester oligomers are derived from a combination of:

terephthalic acid with diethylene glycol, ethylene glycol, 1,3-propanediol, 1,4-butanediol, 1,5-pentanediol, and 1,6-hexanediol or a mixture thereof;

isophthalic acid with diethylene glycol, ethylene glycol, 1,3-propanediol, 1,4-butanediol, 1,5pentanediol, and 1,6-hexanediol or a mixture thereof; or

one or both of succinic and adipic acids with one or more compounds of the formula $HOCH_2(CR^3R^4)_nCH_2OH$, wherein R^3 and R^4 are hydrogen or alkyl containing 1 to 4 carbon atoms and n is 0 or an integer of 1 to 10.

11.The process as recited in claim 9 wherein two different cyclic ester oligomers are present, and a first cyclic ester oligomer is derived from terephthalic acid and diethylene glycol, and a second cyclic ester oligomer is derived from terephthalic acid and 1,4-butanediol.

12. The process as recited in claim 8 wherein said copolyester has a melting point of about 100°C to about 200°C and a heat of fusion of about 5 J/g to about 50 J/g.

13. A copolyester with a degree of randomness of about 0.20 to 0.85.

14. The copolyester as recited in claim 13 wherein said degree of randomness is about 0.30 to about 0.80.

15. The copolyester as recited in claim 13 wherein single repeat units are less than 5 mole percent of all repeat unit blocks.

16. The copolyester as recited in claim 13 wherein single repeat units are not present.

17. A copolyester wherein single repeat unit blocks are not present..

18. The copolyester as recited in claim 17 which has a degree of randomness of about 0.20 to 0.85.